

California Air Resources Board

Greenhouse Gas Quantification Methodology for the Strategic Growth Council Sustainable Agricultural Land Conservation Program

Greenhouse Gas Reduction Fund Fiscal Year 2016-17



March 30, 2017

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Section A. Introduction

The goal of California Climate Investments is to reduce greenhouse gas (GHG) emissions and further the purposes of the Global Warming Solutions Act of 2006, known as Assembly Bill (AB) 32. The California Air Resources Board (CARB) is responsible for providing the quantification methodology to estimate greenhouse gas emission reductions from projects receiving monies from the Greenhouse Gas Reduction Fund (GGRF). CARB develops these methodologies based on the project activities eligible for funding by each administering agency as reflected in the program Expenditure Records available at:

<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/expenditurerecords.htm>.

CARB staff periodically reviews each quantification methodology to evaluate its effectiveness and update methodologies to make them more robust, user-friendly, and appropriate to the projects being quantified.

For the Strategic Growth Council's (SGC) Sustainable Agricultural Land Conservation (SALC) Program, implemented by the Department of Conservation (DOC), CARB staff developed this GHG quantification methodology to be used by SGC/DOC to estimate the avoided GHG emissions of each proposed project (Section B), provide instructions for documenting and supporting the estimate (Section C), and outline the process for tracking and reporting GHG and other benefits once a project is funded (Section D).

This methodology uses calculations to estimate avoided GHG emissions due to the reduction in vehicle miles traveled (VMT) associated with the implementation of a project. Projects will report the total project GHG benefit estimated using this methodology as well as the total project GHG benefit per dollar of GGRF funds requested.

Methodology Development

CARB and SGC/DOC developed this quantification methodology through a public process consistent with the guiding implementation principles of the California Climate Investments, including ensuring transparency and accountability.¹ This quantification methodology was developed in order to estimate the outcomes of proposed projects, inform project selection, and track results of funded projects. The implementing principles ensure that ensure that the methodology would:

- Apply at the project-level;
- Provide uniform methods to be applied statewide, and be accessible by all applicants;
- Use existing and proven tools and methods;
- Use project-level data, where available and appropriate; and
- Result in GHG emissions reduction estimates that are conservative and supported by empirical literature.

CARB reviewed peer-reviewed literature and tools and consulted with experts, as needed, to determine methods appropriate for the SALC project activities. CARB also consulted with SGC/DOC to determine project-level inputs available. The methods were developed to provide estimates that are as accurate as possible with data readily available at the project level.

The first version of this quantification methodology was released in June 2015 for FY 2014-15.ⁱⁱ It was subsequently updated for FY 2015-16, incorporating stakeholder feedback from an SGC “Lessons Learned” workshop held in August 2015. The FY 2015-16 quantification methodology was released for public comment in November 2015 and discussed together with the FY 2015-16 SALC Program Guidelines at a set of three public workshops held across the State. Comments were collected by SGC/DOC and considered in the development of the final FY 2015-16 quantification methodology.ⁱⁱⁱ

This updated FY 2016-17 SALC Quantification Methodology, which incorporates several updated features detailed below, must be used to estimate the net GHG benefit of all proposed SALC projects.

Tools

This quantification methodology uses specific components of the “California Emissions Estimator Model” (CalEEMod) tool to estimate the avoided VMT associated with a project. CalEEMod is a “state-of-the-practice” land use emissions calculator tool designed to quantify GHG emissions and criteria air pollutants associated with land use development projects. It is used by lead agencies to evaluate the GHG emissions and criteria air pollutants of land use development projects pursuant to California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), and for compliance with local air quality rules and regulations. CalEEMod combines project specific data with default data to establish a VMT estimate of a development on the proposed project site. The GHG emissions associated with the VMT estimate are avoided when a project site’s development rights are extinguished. The CalEEMod tool is used statewide, publicly available, subject to regular updates to incorporate new information, free of charge, and available to anyone with internet access. The CalEEMod tool, User’s Guide, and other supporting documents can be downloaded from: www.caleemod.com.

This quantification methodology also references two web-based tools maintained by the US Census Bureau in Appendix B: TIGERweb and American Fact Finder. These tools provide a platform to access various data maintained by the Census Bureau, and are referenced in this quantification methodology to assist in determining a project applicant’s Census land use designation, which is a required input in CalEEMod.

Updates to FY 2016-17 Quantification Methodology

CARB staff periodically review each quantification methodology to evaluate its effectiveness and update methodologies to make them more robust, user-friendly, and appropriate to the projects being quantified. CARB updated this quantification methodology to enhance the analysis and provide additional clarity. The changes include:

- *The use of CalEEMod version 2016.3.1.* CalEEMod 2016.3.1 replaces CalEEMod 2013.2.2 as the tool to calculate avoided VMT through implementation of a SALC project. The new version incorporates trip rates from the Institute of Transportation Engineers 9th edition of the Trip Generation Manual.
- *Updated emissions factors.* Emission factors used to determine the greenhouse gas emissions avoided from avoided VMT has been updated for fuel consumption rates from CARB's Mobile Source Emission Factor Model (EMFAC 2014) and carbon intensity values for different fuel types from CARB's Low Carbon Fuel Standard (LCFS) Program. See Appendix A, "Auto Vehicle Emission Factor Methodology and Lookup Tables."
- *Simplified methodology for determining land use designation.* Map-based guidance on using one of two web-based Census tools has been included to determine if a project site is assigned a rural or urban land use designation. The Department of Conservation's Division of Land Resource Protection (DLRP) staff developed this guidance to assist with determining the "Land Use Setting" selection in CalEEMod. The simplified methodology does not change the underlying data used for the designation. See Appendix B, "Census Resources to Determine the Land Use Setting: Urban vs. Rural Designation."

Sustainable Agricultural Land Conservation Project Types

SGC/DOC developed the SALC Program to protect critical agricultural lands at risk of conversion to urban and rural residential development, avoid GHG emissions from more GHG-intensive land uses, and provide additional co-benefits. There are two SALC Program project types for FY 2016-17:

- Agricultural Conservation Easements
- Agricultural Land Conservation Strategies and Outcomes

Investments in agricultural conservation easements (easements) permanently protect strategically located, highly productive, and critically threatened agricultural land. Funding agricultural land conservation strategies and outcomes result in the implementation of local and regional planning policies that protect agricultural lands from development through the establishment of growth boundaries, zoning ordinances, and/or the use of easements.

Both project types result in the extinguishment of development rights, thereby avoiding increases in GHG emissions by limiting opportunities for expansive, vehicle-dependent

forms of development. This quantification methodology estimates the avoided GHG emissions based on the avoided VMT. Where applicable, project-type specific instructions should be followed.

GHG Emission Reductions Quantification Approach

This methodology estimates the GHG emissions avoided by protecting agricultural land at risk of conversion. This methodology quantifies the avoided GHG emissions of a proposed SALC project from CalEEMod estimates of avoided VMT and well-to-wheels emission factors. This methodology does not use the CalEEMod input or output screens for calculating construction, energy, and water-related emissions. The avoided VMT estimate is based on three inputs: project location (county), land use setting (urban or rural), and number of development rights to be extinguished.

SGC/DOC will estimate the GHG emission reductions of a proposed SALC project for the duration of the project life. For consistency with SGC's Affordable Housing and Sustainable Communities (AHSC) Program, the SALC Program's avoided GHG emissions are quantified over a project life of 30 years.

The metric used by CARB to assess the efficiency of the project to reduce GHG emissions per dollar of GGRF funds will be reported by SGC/DOC as:

$$\frac{\text{Total Avoided GHG Emissions in Metric Tons of CO}_2\text{e}}{\text{GGRF Funds Requested (\$)}}$$

The following sections describe the process for estimating the avoided GHG emissions for proposed projects in the FY 2016-17 SALC Program.

Program Assistance

SGC/DOC staff will calculate the avoided VMT and net GHG benefit of SALC project applications to ensure that the methods described in this document are properly applied to estimate a proposed project's net GHG benefit. Applicants should use the following resources for additional questions and comments:

- Questions on this quantification document should be sent to GGRFProgram@arb.ca.gov.
- For more information on CARB's efforts to support implementation of GGRF investments, see: www.arb.ca.gov/auctionproceeds.
- Questions pertaining to the SALC Program should be sent to the Department of Conservation. Contact information for DOC can be found at: <http://www.conservation.ca.gov/dlrp/SALCP>

Section B. Quantification Methodology

Overview

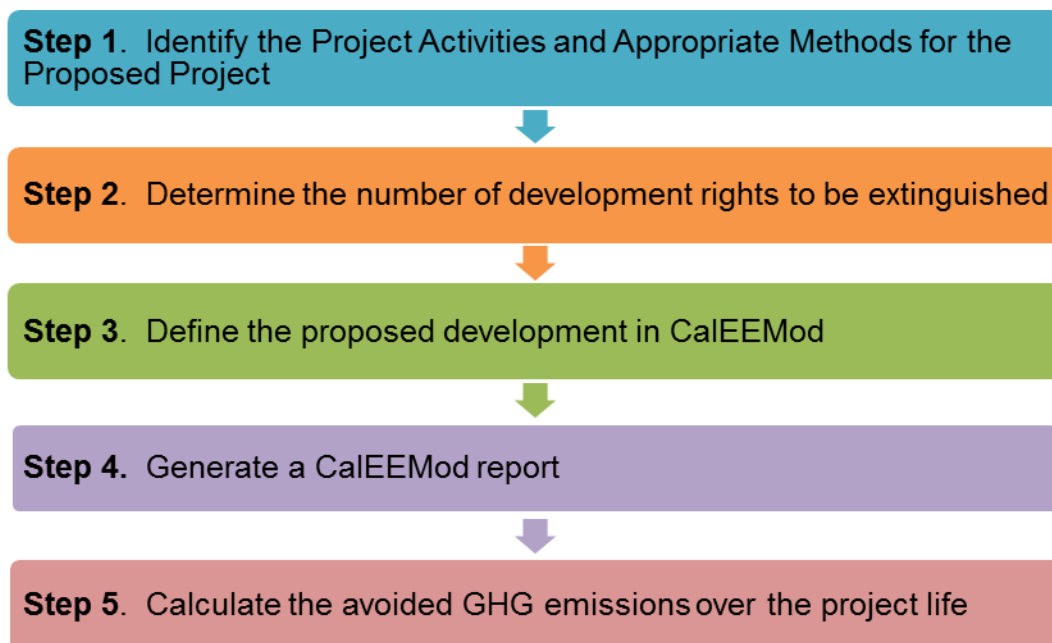
This quantification methodology accounts for avoided GHG emissions due to reduced VMT estimates associated with the implementation of SALC projects. In general, the net GHG benefit is calculated using the following approach:

Table 1. General Approach to GHG Quantification by Project Activity

GHG emissions avoided from Conservation Easement
$\text{Net GHG Benefit} = (\text{GHG emissions associated with VMT}) \times (\text{estimated VMT reduction from project implementation})$

SGC/DOC will follow the steps outlined in Figure 1 to estimate the net GHG benefit from a proposed project. Detailed instructions for each step are provided on subsequent pages.

Figure 1. Steps to Estimating GHG Emission Reductions



Step 1: Identify the Project Activities and Appropriate Methods for the Proposed Project

For GHG quantification purposes, eligible SALC projects consist of two potential project activities. Applicants must identify the project activities from Table 2 that apply to the project. The project activities identified will determine which subsections of this quantification methodology are used in order to estimate the net GHG benefit.

Table 2. Project Activities and Appropriate Quantification Methods

Project Activity	Method Subsection References
Agricultural Conservation Easements	Step 2 Step 3
Agricultural Land Conservation Strategies and Outcomes	Step 4 Step 5

Step 2: Determine the Number of Development Rights to be Extinguished

To quantify the avoided GHG emissions, determine the number of development rights to be extinguished for SALC projects. This is done by establishing the appropriate project geographic boundary, determining the appropriate zoning density, and then calculating the number of development rights to be extinguished based on the zoning density and the number of acres of agricultural land at risk of conversion.

Step 2A: Establish the Appropriate Geographic Boundary for the Project

The FY 2016-17 SALC Program Guidelines^{iv} (FY 2016-17 Guidelines) include requirements to map the project geographic boundary to delineate the project area.¹ DOC/SGC will use the maps provided by applicants, in conjunction with any other relevant maps or resources available to SALC program staff, and Table 1 to establish maximum project geographic boundaries for assessing agricultural lands. The project geographic boundaries vary by eligible project type and serve to define a project area boundary for the purpose of estimating the GHG emission reductions at the application stage. This is particularly applicable to Strategy and Outcome projects which are not expected to have a finalized boundary until implementation.

¹ A project geographic boundary may be revised prior to a project becoming operational, especially for Strategies and Outcome Grants though occasionally for Agricultural Conservation Easements as well. An initial map of the proposed project area is necessary to estimate GHG reductions prior to project selection. However, if the project geographic boundary is later revised, GHG estimates will be recalculated and updated according to the process detailed in Section D.

Table 3. Project Geographic Boundaries

Agricultural Conservation Easement Grants	
Agricultural Conservation Easements	Agricultural lands subject to the easement
Strategy and Outcome Grants	
Agricultural Land Mitigation Program	Agricultural lands within the sphere of influence (SOI) and urban growth boundary (UGB), if applicable, or other applicable boundary such as that defined in a General Plan
Agricultural Conservation Easement Purchase Program	Agricultural lands within the jurisdiction
Adoption of an Agricultural Greenbelt and Implementation Agreement	Agricultural lands within the proposed greenbelt area
Adoption of Urban Limit Lines or Urban Growth Boundaries	If the proposed urban limit line or urban growth boundary is within the city boundary or SOI: Agricultural lands beyond the proposed urban limit line or urban growth boundary within the SOI; If the proposed urban limit line or urban growth boundary is outside the city boundary or SOI: Agricultural land within 2 miles of the proposed urban limit line or urban growth boundary within the county
Increased Zoning Minimum of Designated Strategic Agricultural Areas	Agricultural land within the jurisdiction to be targeted and impacted by the amended zoning

Step 2B: Determine the Appropriate Zoning Density

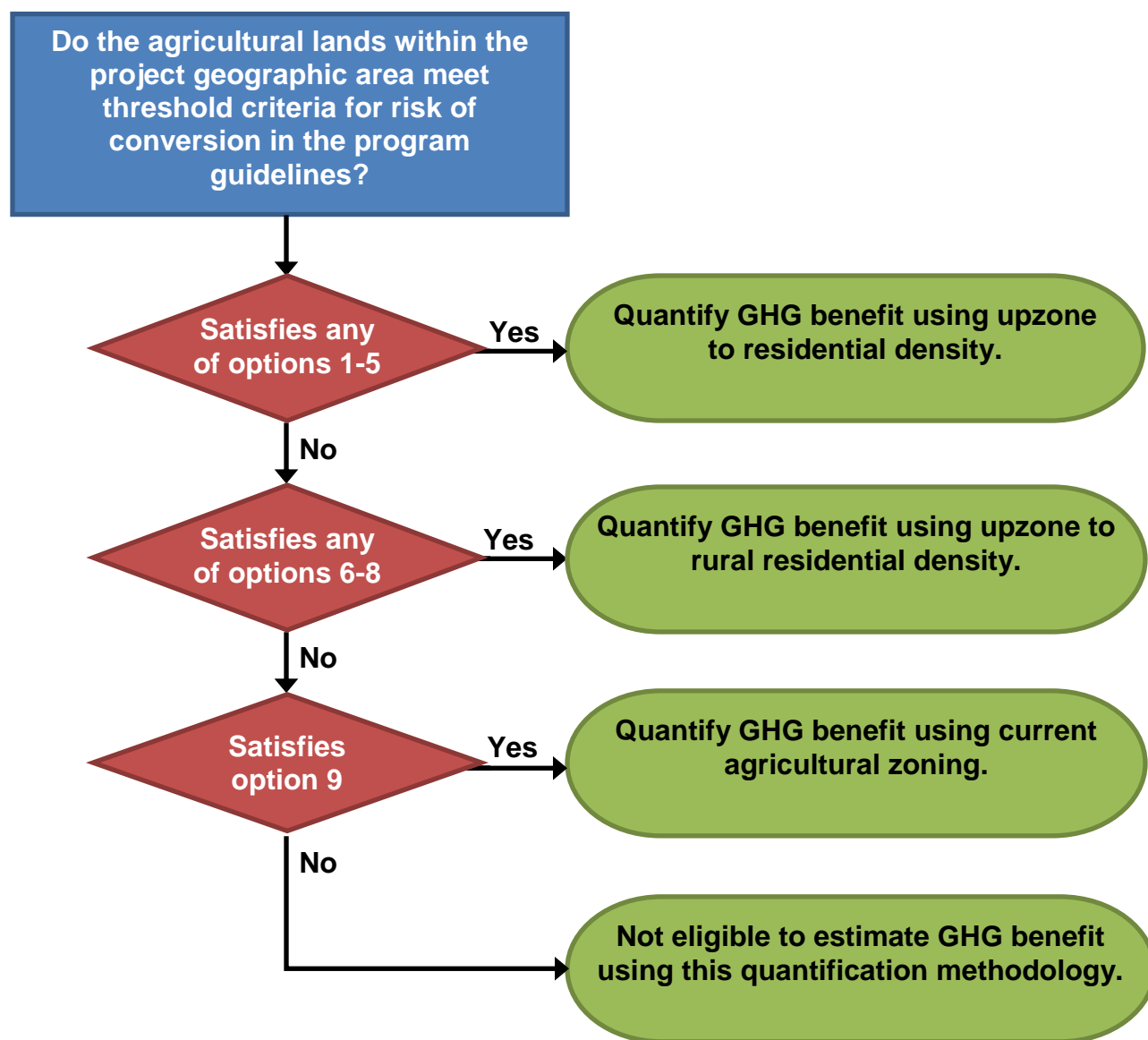
This methodology estimates the GHG emission reductions associated with protecting agricultural land that would otherwise be developed. Current zoning may not accurately reflect the density level of development projects that could be expected for a given property, particularly if in close proximity to existing urban centers. The FY 2016-17 Guidelines provide methods to assess the risk of conversion on agricultural lands based on vicinity development patterns. Use the list of risk options from the FY 2016-17 Guidelines and the Figure 2 decision tree below to determine the appropriate zoning density (i.e. the estimated number of dwelling units per acre if the site were developed) for quantification purposes.²

Different sub-sections of the project area as mapped in Step 2A may be determined to be at risk under different risk criteria in the SALC Program Guidelines. If the risk criteria Options 1-9 classify different portions of the project area as being at risk of conversion to development with different zoning densities, then the number of development rights to be extinguished in Step 2C must be separately determined for each sub-section with a different zoning density. If a portion of the project area is not determined to be at risk

² Agricultural lands determined to be at risk of conversion to residential or rural-residential development using these risk criteria options will calculate the number of development rights extinguished according to the land-use density associated with the demonstrated risk, even if this differs from current zoning. When the risk-based density is higher than the current zoning density, it is referred to as “upzoning.”

of conversion under any of the risk criteria, then no development rights are considered extinguished for these acres, and they are excluded from the GHG reduction calculations.

Figure 2. Decision Tree for Appropriate Zoning Density



Step 2C: Determine the Number of Development Rights to be Extinguished

For the portion of the agricultural lands within the project geographic boundary determined to be at risk of conversion using risk options 1 through 5 in the FY 2016-17 Guidelines, determine the number of development rights to be extinguished based on residential zoning density. The residential density will be determined using the average

single-family residential housing density within the city limit per zoning map and code.³ The number of development rights to be extinguished is equal to the product of the average residential zoning density (dwelling units per acre) and the net acreage of agricultural land within the project geographic boundary at risk of conversion to residential density development.

For the portion of the agricultural lands within the project geographic boundary determined to be at risk of conversion using risk options 6 through 8, determine the number of development rights to be extinguished based on rural residential⁴ density. The rural residential density will be determined using the average rural residential housing density within the nearest city or recognized unincorporated community per zoning map and code. The number of development rights to be extinguished is equal to the product of the average rural residential zoning density (dwelling units per acre) and the net acreage of the agricultural land within the project geographic boundary at risk of conversion to rural residential density development.

For the portion of agricultural lands within the project geographic boundary determined to be at risk of conversion using risk option 9, determine the number of development rights to be extinguished based on the property's current agricultural zoning density. The number of development rights to be extinguished is equal to the product of the current agricultural zoning density (dwelling units per acre) and the net acreage of agricultural land within the project geographic boundary at risk of development at the current agricultural zoning density.

For example, if 80 acres out of a 100 acre project geographic area are determined to be at risk of conversion using risk options 1 through 5, then only these 80 acres will determine development rights extinguished using the residential zoning density. If the remaining 20 acres are determined to be at risk of conversion using one of risk options 6 through 8, then these 20 acres will determine development rights to be extinguished using the rural residential zoning density. Please note that if any acres in the project are not determined to be at risk of conversion in Step 2B, no development rights will be considered to be extinguished for these acres.

While some agricultural lands may be at risk of conversion to commercial, industrial, or recreational development, all projects will assume that one development right is equivalent to a single-family dwelling unit when using this quantification methodology to estimate the avoided VMT and resulting avoided GHG emissions from a proposed project.

³ If agricultural land is in an unincorporated area, DOC will use the nearest city or recognized unincorporated community's average residential housing density to determine the number of development rights to be extinguished. Unincorporated communities are listed in the California Secretary of State's annual Roster: <http://www.sos.ca.gov/administration/california-roster/> or are recognized as Census Designated Places in the US Census: http://www.census.gov/geo/reference/gtc/gtc_place.html

⁴ Terms used for "rural residential" zoning type may differ by county.

DOC/SGC will provide a map identifying at-risk agricultural lands within the project geographic boundaries and the associated number of development rights to be extinguished by the project.

Step 3: Define the Proposed Development

Use the CalEEMod “Project Characteristics” and “Land Use” screens as well as some defined default values for specific data inputs provided below to model a proposed development, defined as the conservative projection of development that could have occurred if the development rights were not extinguished.

Project Characteristics Screen

Cascade Defaults: Leave this box checked

Project Name: Enter project name

Project Location: Select “County” and enter the county of the project site⁵

CEC Forecasting Climate Zone: Enter any climate zone from the drop-down box⁶ (Windspeed and Precipitation Frequency will autofill)

Land Use Setting: Select “Rural” or “Urban” as defined by census block⁷

Start of Construction: Leave default value⁸

Operational Year: Enter the year when the first development rights are expected to be extinguished⁹

Select Utility Co.: Select “Statewide Average”¹⁰ (CO₂, CH₄, and N₂O Intensity Factors will autofill)

Pollutants: All boxes must be checked¹¹

⁵ For projects that span multiple counties, select the county that includes the most extinguished development rights. For counties that are divided between air districts, air basins or district requested subregions; select the sub-county area which best represents the project location.

⁶ The climate zone for a project location within a county can be looked up using the link available on the “Project Characteristics” screen. However, the applicant may enter any allowable climate zone as this information is not used for calculations in this quantification methodology.

⁷ See Appendix B for guidance on the identifying the US Census Bureau’s rural and urban designations for a proposed project area.

⁸ This value is not used in the computation of VMT but may result in an error if modified.

⁹ Assumed to be two years after application date for all easement projects.

¹⁰ These values are not used in the computation of VMT.

Land Use Screen

Cascade Defaults: Leave this box checked

Land Use Type: Select “Residential”

Land Use Subtype: Select “Single Family Housing”

Unit Amount: Enter number of units (equal to the number of development rights extinguished by the project)

Size Metric: Select “Dwelling Unit”

Lot Acreage: Leave default values¹²

Square Feet: Leave default values¹²

Population: Leave default values¹²

Once this data has been entered, click “Next”. Applicant should not enter any values into the following screens: Construction, Operational, Vegetation, and Mitigation. Users may proceed to click on the “Reporting” tab at the top of the screen.

¹¹ CalEEMod is used to calculate VMT reductions only; GHGs are calculated outside of CalEEMod. However, unchecking these boxes may result in an error in CalEEMod.2016.3.1.

¹² These values are not used in the computation of VMT.

Step 4: Generate a CalEEMod Report

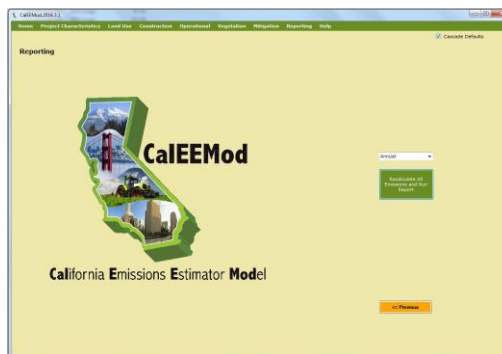
Use the CalEEMod “Reporting” screen to generate an output file that will automatically calculate the estimated avoided VMT from the conservative projection of development that could have occurred at the proposed project site.

Reporting Screen

Select “Annual” emissions

Click “Recalculate All Emissions and Run Report”

CalEEMod will generate a report that includes an “unmitigated” scenario in the CalEEMod report. Unmitigated refers to the estimated avoided VMT from a conservative projection of development that could have occurred at the proposed project site.



The VMT outputs are found in Section 4.2 of the report.

Applicants should use the Total Unmitigated Annual VMT value shown in Figure 3 for the remaining calculations.

User Tip:

GHG emissions are calculated outside of CalEEMod based on the VMT estimates in the CalEEMod report.

Figure 3. CalEEMod Report Section 4.2 VMT Output

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	4,785.00	5,040.00	4385.00	13,379,234	13,379,234
Total	4,785.00	5,040.00	4,385.00	13,379,234	13,379,234

Step 5: Calculate the Avoided GHG Emissions over the Project Life

Calculate the avoided GHG emissions over the 30 year project life using the following equations:

$$\text{Avoided GHG (Yr 1)} = \frac{\text{Annual CalEEMod VMT Reductions} \times \text{AVEF}_{\text{Yr 1}}}{1,000,000} \quad (\text{Eq. 1})$$

$$\text{Avoided GHG (Yr F)} = \frac{\text{Annual CalEEMod VMT Reductions} \times \text{AVEF}_{\text{Yr F}}}{1,000,000} \quad (\text{Eq. 2})$$

$$\text{Avoided GHG (Total)} = \frac{\text{Avoided GHG (Yr 1)} + \text{Avoided GHG (Yr F)}}{2} \times 30 \quad (\text{Eq. 3})$$

Where,

Avoided GHG (Yr 1 or Yr F)	=	The estimated annual avoided GHG emissions resulting from the project in Yr 1 or Yr F (MT CO ₂ e)
Annual CalEEMod VMT Reductions	=	The estimated avoided VMT from a conservative projection of development that could have occurred at the proposed project site (Total Unmitigated Annual VMT from Step 3) (miles)
AVEF (Yr 1 or Yr F)	=	Auto Vehicle Emission Factor by county for Yr 1 or Yr F; see appendix (g CO ₂ e/mile)
Yr 1	=	The first year of the project life (the year when the first development rights are expected to be extinguished)
Yr F	=	The final year of the project life (Yr 1 + 30 years) ¹³
Avoided GHG (Total)	=	The estimated total avoided GHG emissions over the project life (MT CO ₂ e)

SGC/DOC will report the avoided GHG emissions per dollar of GGRF funds requested, calculated as follows:

$$\frac{\text{Total Avoided GHG Emissions over the Project Life (MT CO}_2\text{e)}}{\text{GGRF Funds Requested (\$)}}$$

¹³ If Yr F is greater than 2050, use 2050 as the value for Yr F.

Section C. Documentation

The final step to complete this quantification methodology is to document the estimated avoided GHG emissions and provide documentation of the calculations. SGC/DOC is required to provide electronic documentation to CARB that is complete and sufficient enough to allow the quantification calculations to be reviewed and replicated. Upon request, applicants must make paper and/or electronic copies of any materials necessary to support quantification calculations available to agency staff.¹⁴

The following checklist is provided as a guide; additional data and/or information may be necessary to support project-specific input assumptions.

	Documentation Description	Completed
1.	Contact information for the person who can answer project specific questions from staff reviewers on the quantification calculations	
2.	Project description, including excerpts or specific references to the location in the main SALC application of the project information necessary to complete the applicable portions of the quantification methodology	
3.	Documentation supporting the determination of risk of conversion demonstrated using one of the options to demonstrate risk of conversion in the FY 2016-17 SALC Program Guidelines	
4.	Electronic copies of the CalEEMod input and output files	
5.	Electronic documentation of calculations (spreadsheets, etc.) for all additional calculations	
6.	Summary page with, at minimum, the following information: <ul style="list-style-type: none">▪ Avoided GHG emission estimates for Yr 1 and Yr F;▪ Estimate of total avoided GHG emissions over the project life;▪ GGRF funds requested for the project; and▪ Estimated total avoided GHG emissions per GGRF funds requested	

¹⁴ This pertains primarily to Strategy and Outcome Grant applicants.

Section D. Reporting After Funding Award

Accountability and transparency are essential elements for all projects funded by the GGRF. As described in CARB's Funding Guidelines for Agencies that Administer California Climate Investments (Funding Guidelines),ⁱ each administering agency is required to track and report on the benefits of the California Climate Investments funded under their program(s). Each project funded by the GGRF is expected to provide a real and quantifiable net GHG benefit. The previous sections of this document provide the methods and tools to estimate the net GHG benefit of a proposed project based on project characteristics and assumptions of expected conditions and activity levels. This section explains the minimum reporting requirements for administering agencies and funding recipients during project implementation, termed Phase 1, and after a project is completed, termed Phase 2. Table 11 below shows the project phases and when reporting is required.

Table 4. Quantification and Reporting By Project Phase

	Timeframe	Quantification Methodology Section
Project Selection	Covers the period from solicitation to selection of projects and funding awards	SGC/DOC use methods in this QM to estimate GHG reductions based on application data.
Phase 1	Covers the period from the beginning of the project until it becomes operational or the initial implementation is completed	SGC/DOC use methods in this QM, as needed, to update GHG estimates based on project changes.
Phase 2	Starts after Phase 1 is complete and a project becomes operational	GHG reductions achieved are quantified and reported for a subset of funded projects.

Funding recipients have the obligation to provide, or provide access to, data and information on project outcomes to SGC/DOC. Applicants should familiarize themselves with the requirements below as well as those within the SALC solicitation materials (e.g., guidelines, applications, etc.), and grant agreement.

It is the responsibility of administering agencies to collect and compile project data from funding recipients, including the net GHG benefit and information on benefits to disadvantaged communities.

Phase 1 reporting is required for all SALC funding recipients during project implementation. This quantification methodology provides guidance on how to estimate project benefits to satisfy Phase 1 reporting requirements. At a minimum, CARB expects that SALC funding recipients will report to SGC/DOC once a year during project implementation and once at the end of the project.

Phase 2 reporting is required for only a subset of SALC projects and is intended to document actual project benefits achieved after the project is completed. Phase 2 data collection and reporting will not be required for every project. SGC/DOC will be responsible for identifying the subset of individual projects that must complete Phase 2 reporting, identifying who will be responsible for collecting Phase 2 data, and for reporting the required information to CARB. CARB will work with SGC/DOC to address Phase 2 procedures, including but not limited to:

- The **timelines** for Phase 2 reporting, i.e., when does Phase 2 reporting begin, how long will Phase 2 reporting be needed.
- As applicable, **approaches for determining the subset of projects** that need Phase 2 reporting (i.e., how many **X** projects out of **Y** total projects are required to have Phase 2 reporting).
- **Methods for monitoring or measuring** the necessary data to quantify and document achieved GHG reductions and other select project benefits.
- **Data to be collected**, including data field needed to support quantification of GHG emission benefits.
- Reporting requirements for transmitting the data to CARB or SGC/DOC for program transparency and use in reports.

Once the Phase 2 quantification method and data needs are determined CARB will develop and post the final CARB approved Phase 2 methodology for use in Phase 2 reporting.

Appendix A: Auto Vehicle Emission Factor Methodology and Lookup Tables

DOC/SGC will use Auto Vehicle Emission Factors (AVEF) lookup tables in this appendix to find the appropriate emission factors to calculate a project's avoided GHG emissions from the reduction of vehicle miles traveled, as calculated by CalEEMod.

Methodology for Developing the Emission Factors

GGRF programs estimate transportation-related emissions using a “Well-to-Wheels” approach, which consists of emissions resulting from the production and distribution of different fuel types, including hydrogen and electricity, and any associated exhaust emissions. Applicants use project-specific data to calculate new or avoided VMT and convert VMT to greenhouse gas emissions using Well-to-Wheels emission factors.

To simplify the application process for GGRF Programs, CARB developed emission factors. The emission factors were developed using fuel consumption rates from CARB's Mobile Source Emission Factor Model (EMFAC 2014)^v and carbon intensity values for different fuel types from CARB's Low Carbon Fuel Standard (LCFS) Program.^{vi} This approach provides consistency amongst transportation-related GGRF programs and CARB's Low Carbon Fuel Standard (LCFS) Program.

The emission factors are included as lookup tables in the quantification methodology and the quantification methodology describes which factors to use and how to estimate project-specific emissions. A description of the derivation of the emission factors is included below.

Auto Vehicle Emission Factors

Passenger (auto) vehicle emission factors (AVEF) were derived using these steps:

1. Emissions by county for each calendar year from 2016 through 2050 were downloaded from EMFAC 2014 with the following parameters:
 - a. Annual Average
 - b. EMFAC2011 vehicle categories LDA (Passenger Cars), LDT1 (Light-Duty Trucks with an equivalent test weight $\leq 3,750$ lbs), LDT2 (Light-Duty Trucks with an equivalent test weight between 3,750 and 5,750 lbs), and MDV (Medium-Duty Trucks)
 - c. Aggregated model year
 - d. Aggregated speed
 - e. Gasoline fuel

2. The auto fuel consumption rate (AFCR, in gallons of gasoline per mile) was calculated using the total gallons of gasoline used by each vehicle category divided by the total mileage by vehicle category by county and year, using the following equation:

$$AFCR = \frac{(FC_{LDA} + FC_{LDT1} + FC_{LDT2} + FC_{MDV}) * 1,000}{VMT_{LDA} + VMT_{LDT1} + VMT_{LDT2} + VMT_{MDV}} \quad (\text{Eq. A-1})$$

Where

AFCR = Auto Fuel Consumption Rate (Gallons of Gasoline per Mile)

FC = Total fuel consumption by vehicle type from EMFAC 2014 (1,000 Gallons per Day)

VMT = Total vehicle miles traveled by vehicle type from EMFAC 2014 (Miles per Day)

3. The auto vehicle emission factor (AVEF) was calculated for each year and county by multiplying auto fuel consumption rate the by the Well-to-Wheels carbon content factor for gasoline, which is 11,405.84 g CO₂e per gallon, using the following equation:

$$AVEF = 11,405.84 * AFCR \quad (\text{Eq. A-2})$$

Where

AVEF = Auto Vehicle Emission Factor (Grams of CO₂ per Mile)

AFCR = Total fuel consumption by vehicle type from EMFAC 2014 (1,000 Gallons per Day)

11,405.84 = Well-to-wheels Carbon Content factor for Gasoline (Grams of CO₂ equivalent per Gallon of Gasoline)

Table A-1. FY 2016-17 Auto Vehicle Emission Factors in grams of CO₂e per mile

		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
County	Alameda	507	493	480	466	452	438	424	409	395	383
	Alpine	487	473	459	445	431	417	404	390	377	365
	Amador	483	469	455	441	427	413	399	385	372	360
	Butte	540	523	506	489	473	456	439	423	408	394
	Calaveras	531	516	500	485	470	454	439	424	410	397
	Colusa	517	501	485	469	453	438	423	408	393	381
	Contra Costa	509	494	480	465	450	435	420	406	391	379
	Del Norte	568	553	538	524	509	493	478	464	449	436
	El Dorado	535	519	499	484	468	453	438	424	409	397
	Fresno	518	504	488	473	457	441	426	411	396	385
	Glenn	536	519	501	485	468	452	436	420	405	392
	Humboldt	529	516	503	490	477	463	450	436	423	410
	Imperial	515	499	483	468	453	438	423	411	397	384
	Inyo	542	526	510	495	479	463	448	433	418	405
	Kern	560	541	524	508	491	474	458	443	427	412
	Kings	518	496	480	465	451	436	421	407	392	382
	Lake	542	528	514	500	485	470	455	441	426	413
	Lassen	584	567	550	533	517	500	484	468	452	438
	Los Angeles	553	538	522	508	494	479	464	452	438	425
	Madera	546	540	522	505	481	464	447	440	424	420
	Marin	508	493	479	466	451	437	423	409	395	383
	Mariposa	565	548	531	514	497	480	463	447	432	418
	Mendocino	523	510	497	484	470	457	443	430	416	404
	Merced	535	523	507	490	476	460	443	429	413	402
	Modoc	645	626	607	589	570	552	533	515	498	482
	Mono	531	515	499	484	468	453	438	423	408	395
	Monterey	564	549	534	518	503	487	471	456	440	424
	Napa	499	484	468	454	438	423	408	394	380	367
	Nevada	530	516	502	489	474	460	446	431	418	405
	Orange	516	501	488	474	459	444	430	415	401	388
	Placer	512	496	482	467	451	436	421	407	392	380
	Plumas	624	606	588	571	554	536	519	502	486	471
	Riverside	503	489	474	460	446	431	417	404	390	378
	Sacramento	517	503	486	472	457	442	428	413	399	386
	San Benito	496	481	466	452	440	425	411	397	383	370
	San Bernardino	513	499	482	467	454	439	425	413	399	386
	San Diego	524	509	493	478	463	447	432	418	403	390
	San Francisco	530	516	502	488	474	460	446	432	418	405
	San Joaquin	523	506	491	476	459	443	428	412	397	384
	San Luis Obispo	498	483	469	455	440	426	412	399	385	373
	San Mateo	487	476	466	455	443	431	418	406	393	383
	Santa Barbara	483	469	456	443	430	416	403	390	377	363
	Santa Clara	489	475	462	449	435	421	408	394	381	369
	Santa Cruz	536	522	508	493	481	467	452	437	423	410
	Shasta	541	523	506	489	472	456	440	424	409	396
	Sierra	608	591	574	558	540	523	506	489	473	458
	Siskiyou	584	567	550	534	517	501	484	468	452	438
	Solano	525	509	494	479	463	448	433	418	403	391
	Sonoma	525	509	493	477	461	445	430	415	400	387
	Stanislaus	545	536	519	502	486	469	452	436	420	406
	Sutter	498	482	465	449	433	418	402	388	373	361
	Tehama	530	513	496	480	463	447	432	417	402	389
	Trinity	664	646	627	609	591	572	554	535	517	501
	Tulare	524	505	489	473	458	442	426	410	395	379
	Tuolumne	575	559	542	526	509	493	476	460	444	429
	Ventura	505	490	476	461	448	433	418	405	391	378
	Yolo	522	507	490	476	461	446	431	416	401	388
	Yuba	508	491	470	454	438	422	407	393	379	366

**Table A-1. FY 2016-17 Auto Vehicle Emission Factors in grams of CO₂e per mile
(continued)**

		2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
County	Alameda	372	362	353	345	339	333	327	323	319	316
	Alpine	355	345	337	330	323	318	313	308	305	302
	Amador	349	338	329	321	314	308	302	297	293	289
	Butte	381	370	360	351	343	336	330	324	320	316
	Calaveras	385	374	364	355	348	341	334	329	324	320
	Colusa	369	359	350	342	335	329	323	319	315	311
	Contra Costa	368	358	349	341	334	329	324	319	316	313
	Del Norte	423	412	401	392	383	375	368	361	356	351
	El Dorado	385	374	365	357	350	343	338	333	329	325
	Fresno	373	363	353	345	338	331	326	321	317	313
	Glenn	380	369	360	351	344	338	332	327	323	319
	Humboldt	399	388	378	369	361	353	346	340	335	330
	Imperial	373	363	354	346	340	334	329	324	320	317
	Inyo	394	383	374	365	358	352	346	341	337	333
	Kern	400	389	379	371	364	357	352	347	343	339
	Kings	370	360	351	343	335	329	324	319	315	311
	Lake	401	390	379	370	361	354	347	341	336	331
	Lassen	425	413	402	392	384	376	369	363	358	353
	Los Angeles	413	403	393	385	379	372	366	361	357	353
	Madera	407	395	385	375	367	360	354	349	345	341
	Marin	372	362	354	346	340	334	329	325	321	318
	Mariposa	405	393	383	373	365	358	351	345	340	336
	Mendocino	393	382	372	363	355	348	341	336	330	326
	Merced	389	378	367	358	350	344	338	332	328	324
	Modoc	468	455	443	433	423	415	408	401	395	390
	Mono	383	373	364	355	348	342	336	331	327	323
	Monterey	412	400	390	381	372	365	358	353	348	343
	Napa	356	346	337	330	323	317	312	307	303	300
	Nevada	393	382	372	363	355	348	342	336	331	327
	Orange	377	368	359	352	345	339	334	330	327	324
	Placer	368	358	349	342	335	329	324	319	315	312
	Plumas	457	444	433	422	413	404	396	390	384	378
	Riverside	367	357	349	341	336	331	326	322	318	315
	Sacramento	375	364	355	347	340	334	328	324	320	316
	San Benito	359	349	340	332	325	320	314	310	306	303
	San Bernardino	375	365	356	349	342	336	331	327	323	320
	San Diego	379	369	361	353	347	341	336	332	328	325
	San Francisco	395	385	377	369	363	357	352	348	345	342
	San Joaquin	372	362	353	344	337	331	325	320	316	313
	San Luis Obispo	362	352	344	336	329	323	317	313	309	305
	San Mateo	373	365	357	351	345	340	335	331	328	325
	Santa Barbara	353	343	335	327	321	315	309	305	301	297
	Santa Clara	359	350	341	334	328	322	317	313	310	307
	Santa Cruz	398	387	377	369	361	354	347	342	337	333
	Shasta	384	373	363	355	348	341	336	331	327	323
	Sierra	445	433	422	412	404	396	390	384	378	374
	Siskiyou	425	414	403	394	386	378	372	366	361	357
	Solano	380	370	361	353	346	340	335	330	327	324
	Sonoma	375	364	355	347	340	333	328	323	319	316
	Stanislaus	393	381	371	362	354	347	341	335	331	327
	Sutter	349	339	330	322	315	309	304	300	296	293
	Tehama	377	367	357	349	342	336	330	325	321	318
	Trinity	487	473	461	449	439	430	421	414	408	402
	Tulare	367	356	346	338	330	324	318	313	309	305
	Tuolumne	416	404	392	382	373	365	358	352	347	342
	Ventura	367	358	349	342	336	331	326	322	318	315
	Yolo	376	366	356	348	341	335	329	324	320	317
	Yuba	355	345	336	328	321	315	310	306	302	311

**Table A-1. FY 2016-17 Auto Vehicle Emission Factors in grams of CO₂e per mile
(continued)**

	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
County	Alameda	313	311	309	308	306	305	304	304	303
	Alpine	299	297	295	293	292	291	291	290	289
	Amador	286	283	281	279	277	276	275	274	272
	Butte	312	310	307	305	304	303	301	301	299
	Calaveras	317	314	311	309	307	305	304	302	301
	Colusa	309	306	304	303	301	300	299	299	298
	Contra Costa	310	308	306	305	303	302	302	301	300
	Del Norte	346	342	339	336	333	331	329	327	325
	El Dorado	322	320	318	316	314	313	312	311	310
	Fresno	311	308	306	304	303	302	301	300	299
	Glenn	316	314	312	310	309	308	307	306	305
	Humboldt	326	322	319	316	313	311	309	307	306
	Imperial	314	312	310	308	307	306	305	304	303
	Inyo	330	328	325	324	322	321	320	319	318
	Kern	336	334	332	330	329	328	327	326	325
	Kings	309	306	304	303	301	300	299	299	298
	Lake	327	323	320	318	315	313	312	310	309
	Lassen	349	346	343	340	338	336	335	333	332
	Los Angeles	350	348	346	344	342	341	340	339	338
	Madera	338	335	333	331	330	329	328	327	326
	Marin	315	313	311	310	309	308	307	306	305
	Mariposa	332	329	326	323	321	319	318	317	315
	Mendocino	322	318	315	312	310	308	306	304	303
	Merced	321	318	316	314	313	311	310	309	308
	Modoc	386	382	379	376	374	372	370	369	368
	Mono	320	317	315	313	312	311	309	308	307
	Monterey	340	336	334	331	329	328	326	325	324
	Napa	298	295	294	292	291	290	289	288	287
	Nevada	323	320	317	314	312	310	308	307	305
	Orange	321	319	318	316	315	314	314	313	313
	Placer	310	308	306	304	303	302	301	301	300
	Plumas	374	370	366	363	361	358	356	354	352
	Riverside	312	310	308	307	306	305	304	303	303
	Sacramento	314	311	309	308	306	305	304	304	303
	San Benito	300	298	296	294	293	292	291	290	289
	San Bernardino	317	315	313	311	310	309	308	307	306
	San Diego	323	321	319	318	317	316	315	315	314
	San Francisco	339	338	336	335	334	333	332	332	331
	San Joaquin	310	307	305	304	302	301	300	299	298
	San Luis Obispo	302	300	298	296	295	293	292	291	290
	San Mateo	323	321	319	318	317	316	315	315	314
	Santa Barbara	294	292	290	288	286	285	284	283	282
	Santa Clara	304	302	300	299	298	297	296	295	294
	Santa Cruz	329	326	323	321	319	318	316	315	314
	Shasta	320	318	316	314	313	312	311	310	309
	Sierra	370	367	364	362	360	358	357	356	355
	Siskiyou	354	351	348	346	344	342	341	340	339
	Solano	321	319	317	316	314	313	313	312	311
	Sonoma	313	310	308	307	305	304	303	303	302
	Stanislaus	324	321	319	317	316	314	313	313	312
	Sutter	290	288	286	285	283	282	281	280	280
	Tehama	315	312	310	309	307	306	305	304	303
	Trinity	397	393	389	385	383	380	378	376	374
	Tulare	302	299	297	295	294	293	292	291	290
	Tuolumne	338	334	331	328	326	324	322	320	319
	Ventura	312	310	309	307	306	305	305	304	303
	Yolo	314	312	310	308	307	306	305	304	303
	Yuba	308	306	304	302	301	300	299	298	297

**Table A-1. FY 2016-17 Auto Vehicle Emission Factors in grams of CO₂e per mile
(continued)**

		2047	2048	2049	2050
County	Alameda	302	302	301	301
	Alpine	289	288	288	288
	Amador	271	270	270	269
	Butte	299	298	298	297
	Calaveras	299	299	298	298
	Colusa	297	297	296	296
	Contra Costa	300	299	299	299
	Del Norte	322	321	320	319
	El Dorado	309	308	308	308
	Fresno	299	299	298	298
	Glenn	304	304	303	303
	Humboldt	303	302	300	299
	Imperial	303	302	302	301
	Inyo	317	316	316	315
	Kern	325	324	324	324
	Kings	297	297	296	296
	Lake	306	305	304	304
	Lassen	330	329	328	328
	Los Angeles	338	337	337	336
	Madera	325	325	324	324
	Marin	305	305	305	304
	Mariposa	313	313	312	311
	Mendocino	300	299	298	297
	Merced	307	307	307	306
	Modoc	365	364	364	363
	Mono	306	306	305	305
	Monterey	322	321	320	320
	Napa	287	286	286	286
	Nevada	302	301	300	299
	Orange	312	311	311	311
	Placer	299	299	298	298
	Plumas	349	348	346	345
	Riverside	302	302	301	301
	Sacramento	302	301	301	301
	San Benito	288	288	287	287
	San Bernardino	305	305	304	304
	San Diego	314	313	313	313
	San Francisco	331	331	330	330
	San Joaquin	298	297	297	297
	San Luis Obispo	289	289	288	288
	San Mateo	314	313	313	313
	Santa Barbara	280	280	279	279
	Santa Clara	294	294	293	293
	Santa Cruz	312	311	310	310
	Shasta	308	308	308	307
	Sierra	353	352	351	350
	Siskiyou	337	336	336	335
	Solano	311	310	310	310
	Sonoma	301	301	300	300
	Stanislaus	311	310	310	310
	Sutter	280	279	279	279
	Tehama	303	302	302	301
	Trinity	371	370	369	368
	Tulare	289	289	289	288
	Tuolumne	316	315	314	314
	Ventura	303	302	302	302
	Yolo	303	302	302	301
	Yuba	296	296	295	295

Appendix B: Census Resources to Determine the Land Use Setting: Urban vs. Rural Designation

Two Census web-based applications may be used in conjunction with the FY 2016-17 Sustainable Agricultural Land Conservation Program Quantification Methodology to determine if a project area is assigned an Urban or Rural designation by the US Census Bureau: TIGERweb and American Fact Finder. This appendix was initially prepared by the Department of Conservation's Division of Land Resource Protection (DLRP) staff in order to assist in determining the "Land Use Setting" selection in CalEEMod.

Background

The FY 2016-17 SALC quantification methodology requires a determination of the Census land use setting, defined as either urban or rural, as an input to CalEEMod. The Urban-Rural designation code is contained at the block level in Census data and is used to determine the Land Use Setting. Previous versions of this quantification methodology only referenced a tabular list of Census data that did not allow for visual identification of a proposed project area. Spatial layers in Census web-based applications can be reviewed visually and compared to a proposed project location using web-based tools maintained by the US Census Bureau to assist in this determination. Proposed projects may be entirely urban, entirely rural or a combination of both, which can be inferred visually at the block level. If a project spans more than one census block with differing urban-rural designations, applicants should split the project area into rural and urban components for the purposes of calculating avoided VMT in CalEEMod.

Census Tools

There are two useful web-based tools maintained by the Census to display data: TIGERweb and American Fact Finder. TIGERweb is a web-based mapping tool that allows users to visualize TIGER Census data. The application allows feature search by name, query by location and geographic boundary display. There are two versions: TIGERweb and TIGERweb Decennial Applications (2010 Census). Both applications feature a layer to display the Census identified Urban Areas.

American Fact Finder provides data from a range of censuses and surveys. American Fact Finder also allows the selection and graphic display of all Fully/Partially Urban Census Tracts or Rural Census Tracts. Both TIGERweb and American Fact Finder provide graphic display of geographic entities and query functions.

Census Urban Areas Definitions

The Census Urban Areas^{vii} are composed of urbanized areas and urban clusters. The designation of the Urban Area boundaries are reviewed and updated every 10 years following the Census. The most recent 2010 Census data contains the Urban-Rural designation at the block level, the smallest unit of area in the Census. The Census blocks are grouped into Block Groups, which in turn make up the Census Tracts. Densities of blocks appear greater in the urban area depending on the population of the area. It is important to note that the designation within the data attributes is available only at the block level. As a result, portions of a tract in a rural area may have different designations at the block level.

Urban and Rural Definition from the Census:

The Census Bureau's urban-rural classification is fundamentally a delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses. For the 2010 Census, an urban area will comprise a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters.

The Census Bureau identifies two types of urban areas:

- *Urbanized Areas (UAs) of 50,000 or more people;*
- *Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.*

'Rural' encompasses all population, housing, and territory not included within an urban area.

Census User Guides

TIGERweb User Guide

The TIGERweb User Guide is available on the Census website.^{viii} The guide provides an overview of the step by step procedure for using TIGERweb to view Census Tract boundaries or obtain the Census Tract number. Census representatives recommend using Internet Explorer or Firefox as functionality may not be available in other browsers unless popups from Census are allowed.

American Fact Finder User Guide

Guidance for using American Fact Finder is available online at the Census.^{ix} Using advanced search you can search all available data by topic and geographic area. American Fact Finder was chosen for the example in this document due to its ease of use in locating the project vicinity and displaying the Census blocks to determine the proper designation.

Example: Using American Fact Finder to determine a designation in Delhi, CA

As an example, procedural steps for using the American Fact Finder web-based application for accessing Census Geographic data is provided below determining the Urban/Rural designation for 40 acres of land south of Delhi High School in the northeastern corner of the intersection of Merced Avenue and August Avenue, in the unincorporated town of Delhi in Merced County, as well as for a parcel of agricultural land 1 mile west of this location. These steps are intended to determine both the Census Tract number and the Census Urban-Rural designation. The user must infer the project location using the geographic layers in the data view.

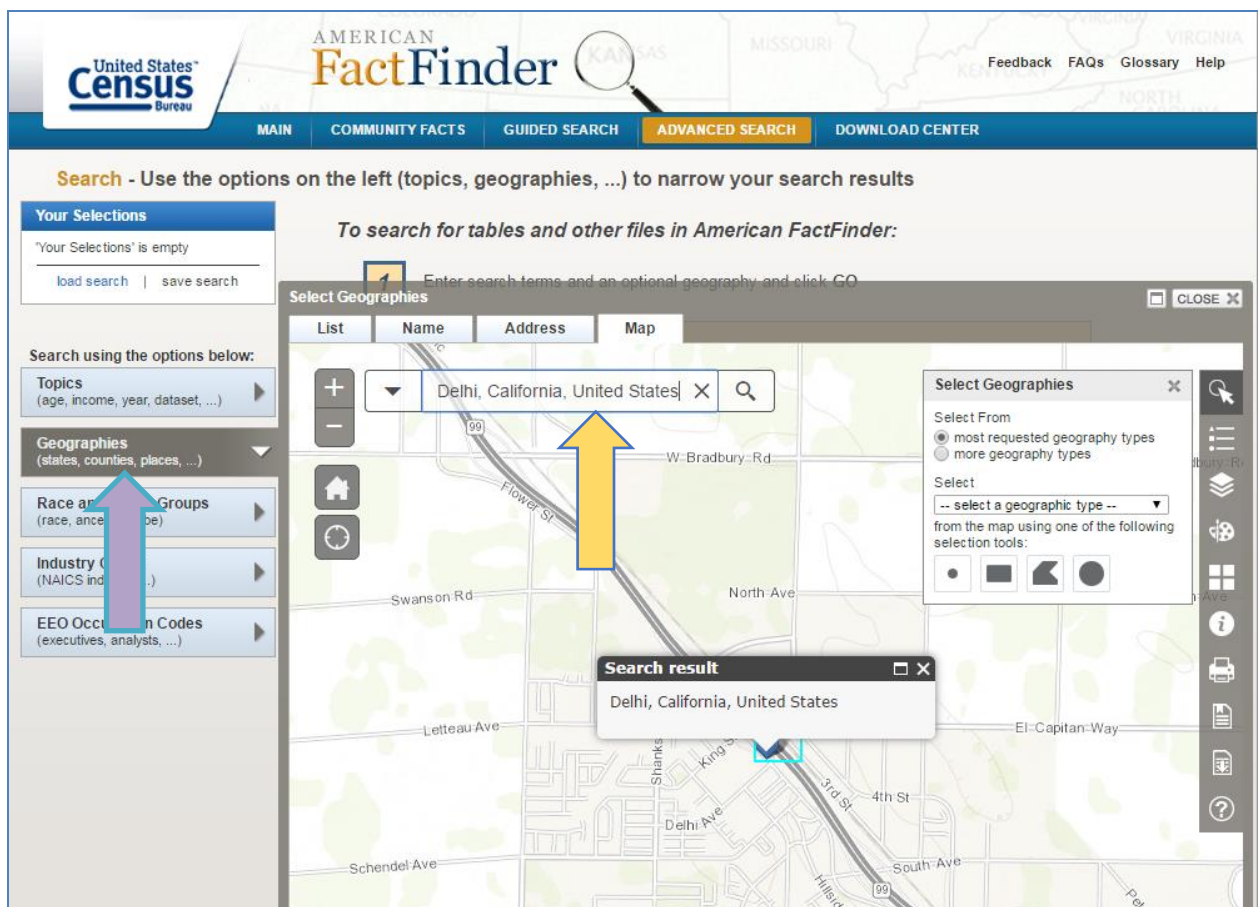
To start, begin at the main American Fact Finder website:

<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

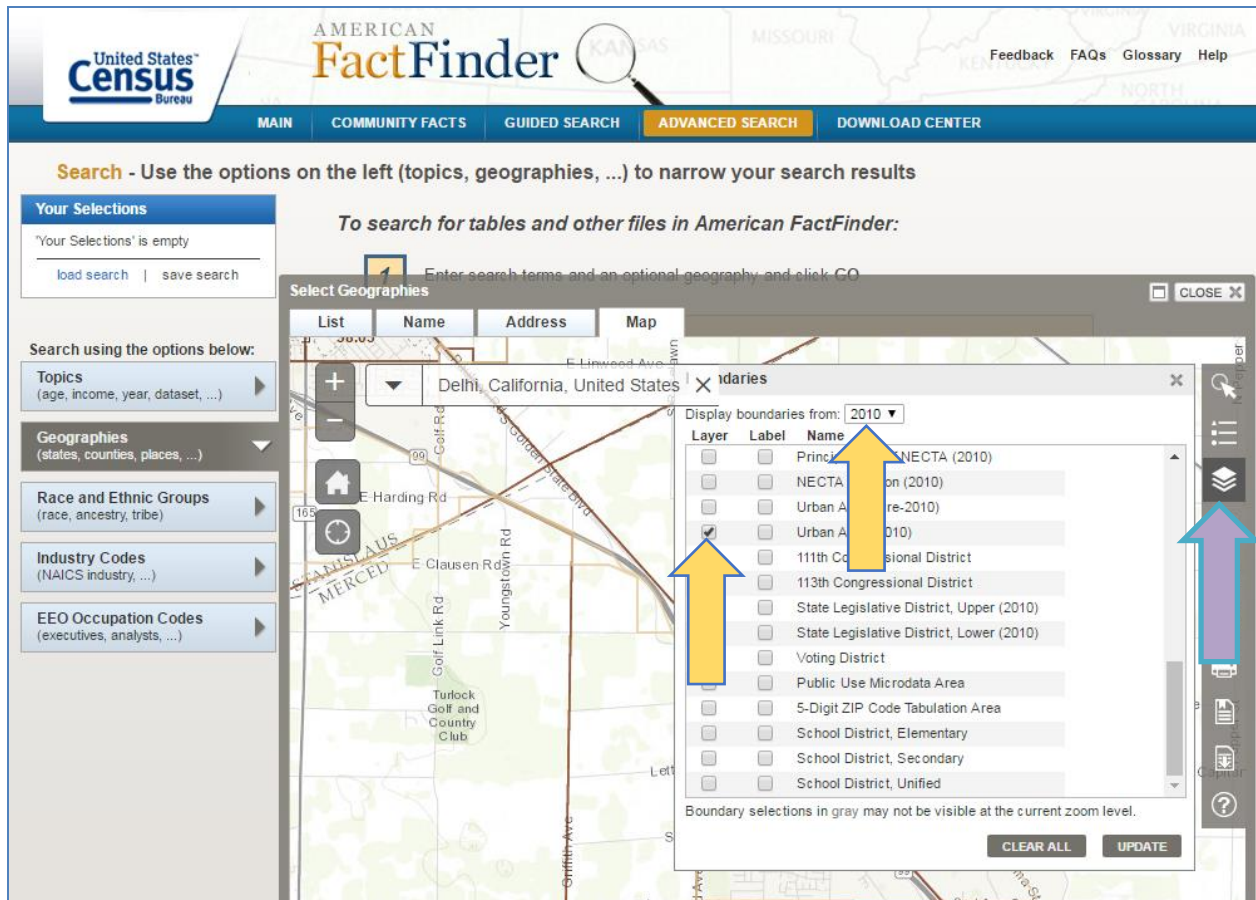
Click “Advanced Search” option in the browser window. Then click the “Show me all” button to access all geographic types and datasets.



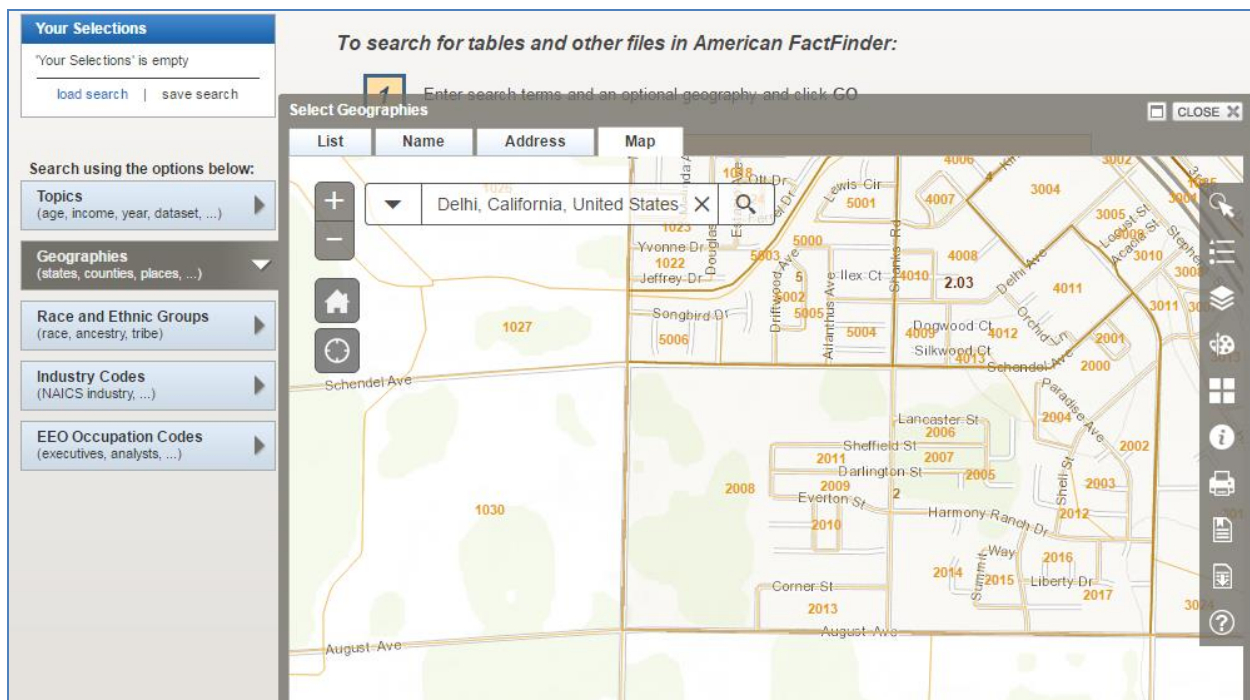
On the left hand side navigation column of the browser window, find and select “Geographies”. A “Select Geographies” window will appear. On this new window’s “Map” tab, enter “Delhi, California” in the search bar. The webpage may autocomplete your input.



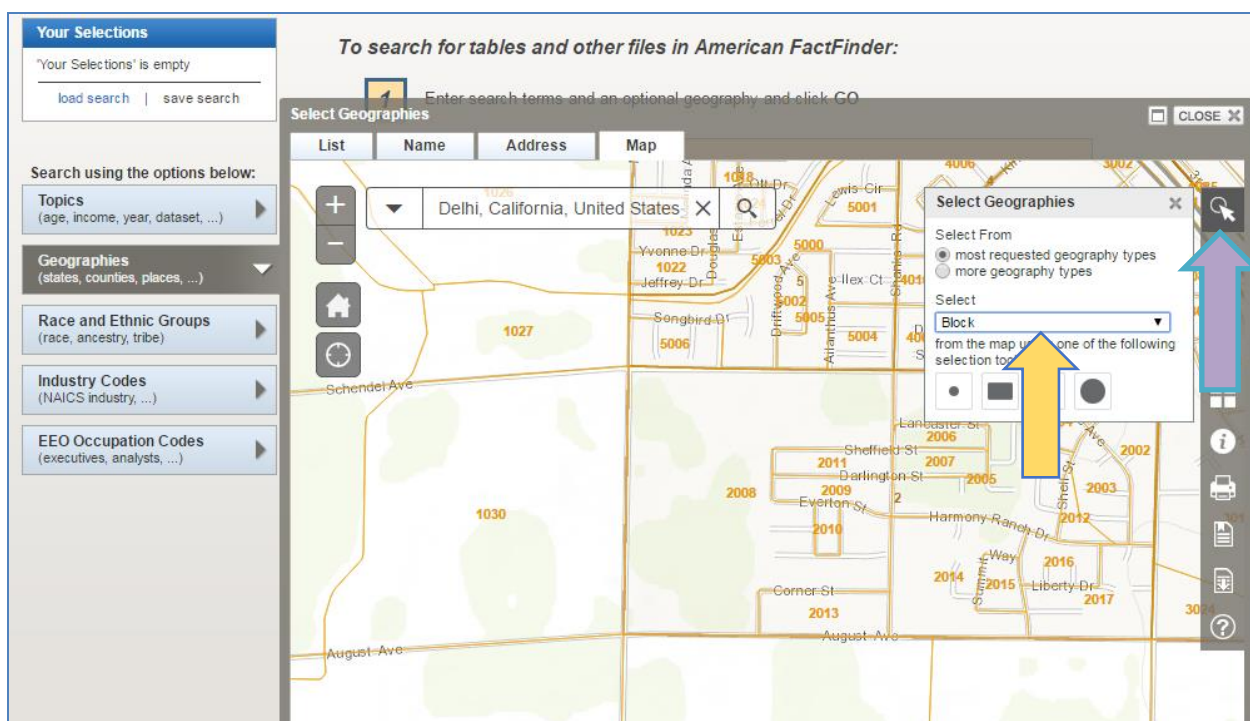
On the right hand side toolbar, click the “Boundaries” button (🗺️, third icon from top). Select “2010” from the “Display boundaries from:” dropdown list. Scroll through boundaries option and select the “Layer” box and the “Label” box for “Block”, “Census Tract” and “Block Group”, and “Layer” for “Urban Area (2010)”. Click “Update” to refresh the map.



Close the “Boundaries window” to view the faint brown outlines of the Urban Areas and labeled Census Tracts within the map view. Zoom into the area of interest (the intersection of Merced Avenue and August Avenue).

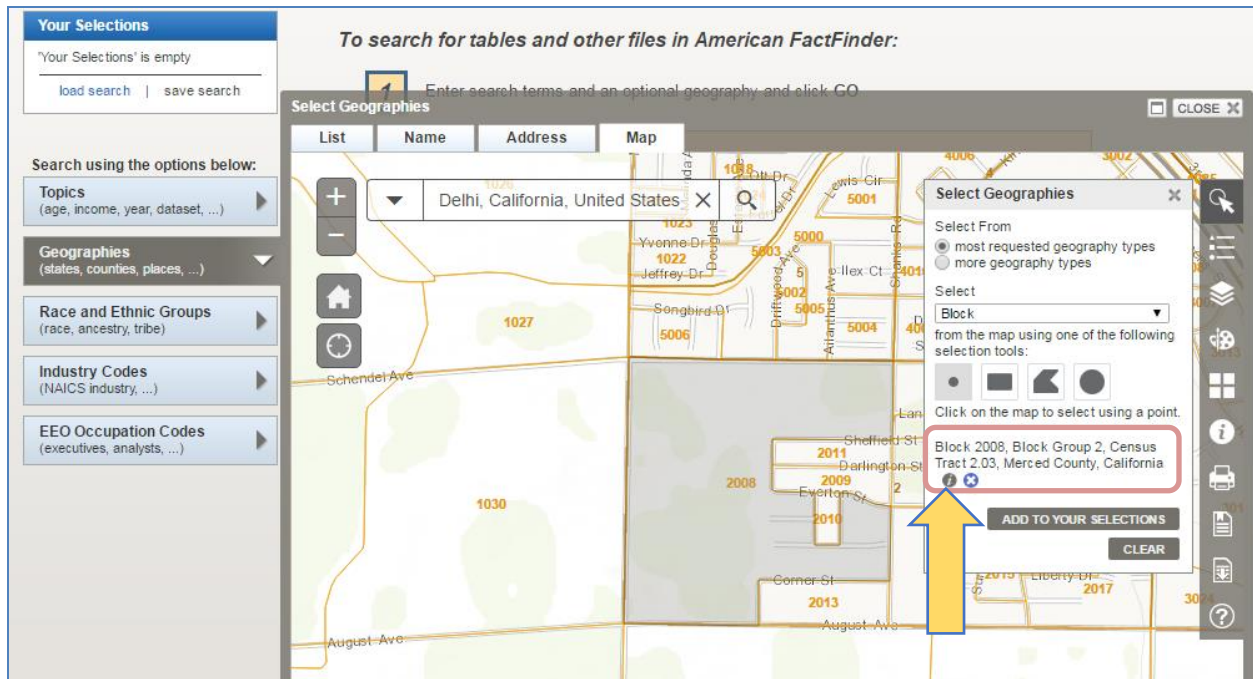


Choose the “Select Geographies” tool from the toolbar (📍, top icon). Select “Block” from the dropdown menu. Blocks may only appear as an available choice when only a small area of map is visible. If “Block” is not available, zoom in until this selection becomes available.



Choose the dot tool from the four choices then click on the area of interest on the map.

The selected Census Tract is now shaded gray and the result is displayed in the lower part of the “Select Geographies box” as “Block 2008, Block Group 2, Census Tract 2.03, Merced County, California.” Click on the small information icon “i” button following the “Block 2008, Block Group 2, Census Tract 2.03, Merced County, California” text to identify the full results of the query for the selected block.




The new pop up window contains the Geographic Identifiers for that block in 2010. Of specific interest are the Census Tract, Code, Legal/Statistical Area Description Code and Name, and Urban/Rural Flag.

The Census blocks nest within all other tabulated Census geographic areas, are the smallest unit of area, and comprise the Urban Area layer displayed in the map window. The Urban-Rural flag within the Census block attributes will be either “U” indicating an Urban designation or “R” indicating a Rural designation. Note that the Urban/Rural flag is only available in the 2000 or 2010 Census data at the block level.

This completes the process. The 40 acres south of Delhi High School are designated Urban.

Block 2008, Block Group 2, Census Tract 2.03, Merced County, California

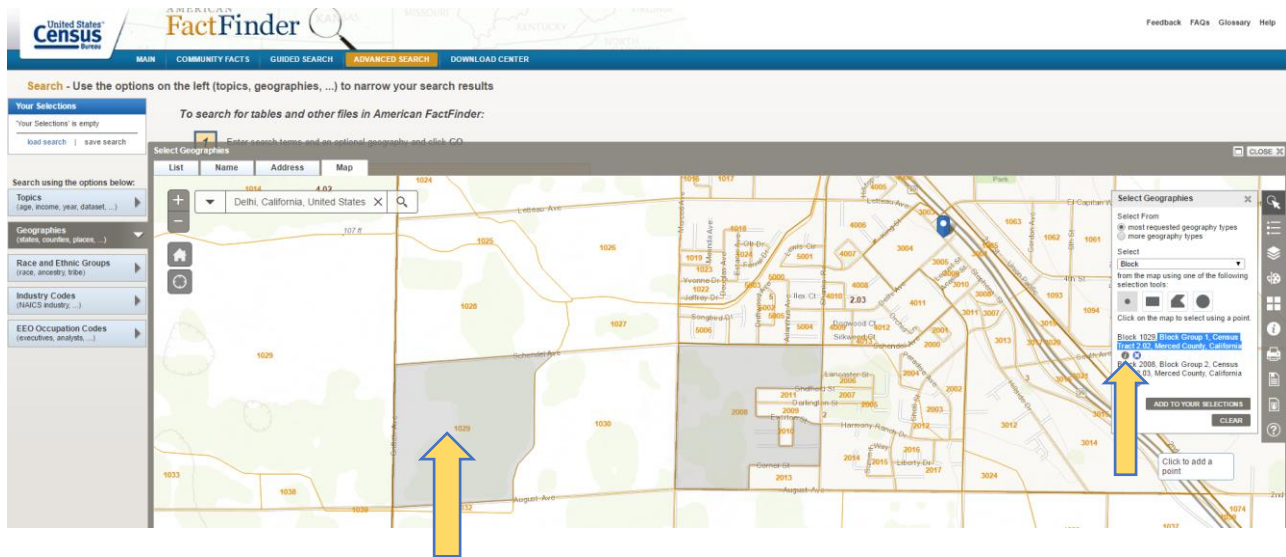
Geographic Identifiers 

Map View 

	2010
5-Digit ZIP Code/ZIP Code Tabulation Area	95315
Alaska Native Regional Corporation (FIPS)	99999
American Indian Reservation (Census)	9999
American Indian Reservation Trust Lands/Hawaiian Home Lands Indicator	9
American Indian Tribal Subdivision (Census)	999
Census Block	2008
Census Block Group	2
Census Tract	000203
Code	1000000US060470002032008
Combined New England City and Town Area	999
Combined Statistical Area	999
Congressional Districts 111th Congress	18
Congressional Districts 113th Congress	16
Consolidated City (FIPS)	99999
Core Based Statistical Area	32900
County (FIPS)	047
County Subdivision (FIPS)	91670
Division	9
Geographic Component Code	00
Geographic Variant Code	00
Land Area (Square Miles)	.201
Legal/Statistical Area Description Code	BK
Legal/Statistical Area Description Name	Block 2008
Metropolitan Division	99999
Name (without LSAD or path)	2008
New England City and Town Area	99999
New England City and Town Area Division	99999
Place (FIPS)	18464
Region	4
School District, Elementary	99999
School District, Secondary	99999
School District, Unified	00039
State (FIPS)	06
State Legislative District, Lower Chamber	017
State Legislative District, Upper Chamber	012
Sub-Minor Civil Division (FIPS)	99999
Summary Level Code	100
Urban Area	89083
Urban/Rural Flag	U
Voting District	40340


See the Census Bureau's [Geographic Boundary Change Notes](#) for information about geographic changes.

For comparative purposes, now select Block 1029 (Block Group 1, Census Tract 2.02, Merced County, California) about 1 mile west of our previous location.



Once again, click on the small information icon “i” button following the “Block 1029, Block Group 1, Census Tract 2.03” text to identify the full results of the query for the selected block. On the output pop-up page, the Urban/Rural flag this time is “R.” Thus this block of agricultural land, only a mile away from the previous location, has been designated by the Census as Rural.

Block 1029, Block Group 1, Census Tract 2.02, Merced County, California

Geographic Identifiers 

Map View 

	2010
5-Digit ZIP Code/ZIP Code Tabulation Area	95315
Alaska Native Regional Corporation (FIPS)	99999
American Indian Reservation (Census)	9999
American Indian Reservation Trust Lands/Hawaiian Home Lands Indicator	9
American Indian Tribal Subdivision (Census)	999
Census Block	1029
Census Block Group	1
Census Tract	000202
Code	1000000US060470002021029
Combined New England City and Town Area	999
Combined Statistical Area	999
Congressional Districts 111th Congress	18
Congressional Districts 113th Congress	16
Consolidated City (FIPS)	99999
Core Based Statistical Area	32900
County (FIPS)	047
County Subdivision (FIPS)	91670
Division	9
Geographic Component Code	00
Geographic Variant Code	00
Land Area (Square Miles)	.233
Legal/Statistical Area Description Code	BK
Legal/Statistical Area Description Name	Block 1029
Metropolitan Division	99999
Name (without LSAD or path)	1029
New England City and Town Area	99999
New England City and Town Area Division	99999
Place (FIPS)	99999
Region	4
School District, Elementary	99999
School District, Secondary	99999
School District, Unified	00039
State (FIPS)	06
State Legislative District, Lower Chamber	017
State Legislative District, Upper Chamber	012
Sub-Minor Civil Division (FIPS)	99999
Summary Level Code	100
Urban Area	99999
Urban/Rural Flag	R
Voting District	40340

Digital GIS Data files available from the Census

Census data is available as GIS shapefiles by state or through the web data services for GIS software users. The separate Census layer featuring the Urban Areas displays the spatial extent of the Urban-Rural designation. See the “TIGERLine How to guides” on the Census Website for acquiring digital files for use with ArcGIS at:

<https://www.census.gov/geo/education/howtos.html>, or the guide to TIGER shapefiles at: http://www2.census.gov/geo/pdfs/education/tiger/Downloading_TIGERLine_Shp.pdf.

ArcGIS users may access the TIGERweb data layers from the Census through ArcGIS REST Services. This is a simple way to access the most current data without storing and managing data locally. Census TIGERweb services are available at tigerweb.geo.census.gov.

See TIGERweb links for Urban or Tracts_Blocks at https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb_restmapservice.html or the Census2010 map server link Urban or Tracts_Blocks at <https://tigerweb.geo.census.gov/arcgis/rest/services/Census2010>

The Census FAQs^{vii} on urban and rural definitions, Urban-Rural Classification Program and urban-rural delineation results is a useful reference. Relationship files are available to search for places, counties and urban areas. The tables can be searched to determine if a particular area of interest is within an urban area. Reference maps of each urban area are also available to help understand the spatial data.

Endnotes

ⁱ California Air Resources Board. Funding Guidelines for Agencies Administering California Climate Investments. (December 21, 2015)
<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm>.

ⁱⁱ California Air Resources Board. “Greenhouse Gas Quantification Methodology for the Strategic Growth Council Sustainable Agricultural Land Conservation Program, Agricultural Conservation Easements, Greenhouse Gas Reduction Fund, Fiscal Year 2014-15.” (June 5, 2015)
<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/sgcsalcpqm.pdf>.

ⁱⁱⁱ California Air Resources Board. “Greenhouse Gas Quantification Methodology for the Strategic Growth Council Sustainable Agricultural Land Conservation Program, Greenhouse Gas Reduction Fund, Fiscal Year 2015-16.” (December 18, 2015)
https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/sgc_salcpqm_15_16.pdf.

^{iv} Department of Conservation. “Sustainable Agricultural Lands Conservation Program Introduction.” (2016) <http://www.conservation.ca.gov/dlrp/SALCP/Pages/Index.aspx>.

^v California Air Resources Board. “EMFAC2014 Web Database.” (2014)
<http://www.arb.ca.gov/emfac/2014/>.

^{vi} California Air Resources Board “Low Carbon Fuel Standard.” (February 10, 2017)
<http://www.arb.ca.gov/fuels/lcfs/lcfs.htm>.

^{vii} U.S. Census Bureau. “2010 Census Urban Area FAQs.” (February 9, 2015)
<https://www.census.gov/geo/reference/ua/uafaq.html>.

^{viii} U.S. Census Bureau. “TIGERweb User Guide.” (December 12, 2016)
https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb_User_Guide.pdf.

^{ix} U.S. Census Bureau. “American FactFinder.” (October 5, 2011)
http://factfinder.census.gov/faces/nav/jsf/pages/using_factfinder.xhtml.